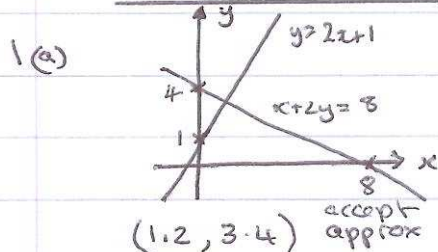


Methods 1 Revision, Algebra Questions A, Solutions



(A2)

9(a) 7

(A2)

(b) $\frac{1}{16}^{3/2} = \frac{1}{4^3} = \frac{1}{64}$

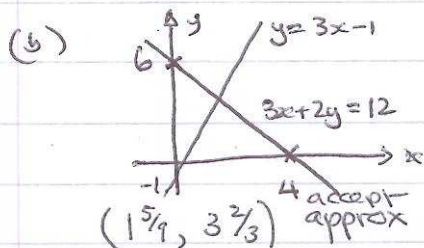
(A2)

10(a) $2ab(a - 5b)$

(A2)

(b) $11pq(2q^2 + 5p)$

(A2)



(A2)

(A2)

(A1)

11(a) $\frac{7}{2x+1}$

(A2)

(b) $\frac{3(x+2)}{(x+2)(x+3)} = \frac{3}{x+2}$

(M1) (A1)

12(a) $\frac{3x}{15} + \frac{3(x-2)}{15} = 6$

(M1)

$5x + 3x - 6 = 90$

(M1)

$8x = 96$

(M1)

$x = 12$

(A1)

(b) $\frac{3(x-2)}{15} + \frac{5x}{15} = \frac{7.5x}{15}$

(M1)

$3x - 6 + 5x = 7.5x$

$-6 = 0.5x$

(M1)

$x = -12$

(A1)

2(a) $6x + 3 + 10x - 4$
 $= 16x - 1$

(M2)

(A1)

(b) $15x - 5 - 4x + 2$
 $= 11x - 3$

(M2)

(A1)

3(a) $7(2x + 3)$

(A2)

(b) $5(2x - 5)$

(A2)

4(a) x^7

(A1)

(b) x^5

(A1)

5(a) $x^2 - 5x + 4x - 20$
 $= x^2 - x - 20$

(M2)

(A1)

(b) $(x-3)(x-3)$
 $= x^2 - 3x - 3x + 9$
 $= x^2 - 6x + 9$

(M1)

(M1)

(A1)

6(a) $12x = 10x + 2$
 $2x = 2$
 $x = 1$

(M1)

(M1)

\Rightarrow square is 3×3
 Area = 9 cm^2

(A1)

(b) $6x + 3 = 10x + 1$

(M1)

$2 = 4x$

(M1)

$x = 0.5$

(M1)

\therefore rectangle is 2×1
 area = 2 cm^2

(A1)

7(a) $5x + 4 = 2x + 25$
 $3x = 21$
 $x = 7$

(b) $3y + 17 = 7y - 15$

$32 = 4y$

$y = 8$

8(a) $(a-2)(a-5) = 0$

(M1)

$a = 2 \text{ or } 5$

(A2)

(b) $(w-4)(w+3) = 0$

(M1)

$w = 4 \text{ or } -3$

(A2)

13(a) $(3x-1)(3x-6)$
 $(3x-1) \times (x-2)$
 $= (3x-1)(x-2)$

$3 \times 2 = 6$

(M1) (A1)

(b) $(6x+2)(6x+3)$
 $2(3x+1)(2x+1)$
 $= (3x+1)(2x+1)$

$6 \times 1 = 6$

(M1) (A1)

14(a) $(x+4)^2 - 16 + 3$
 $= (x+4)^2 - 13$

(M2) (A1)

(b) $(x-3)^2 - 9 - 12$
 $(x-3)^2 - 21$

(M2) (A1)

15(a) eg 3, 4, 5 $3+4+5=12$
 $12 \div 3 = 4$ works?

$\frac{n+(n+1)+n+2}{3} = \frac{3n+3}{3} = n+1$

middle number, so proven

(b) 3, 4, 5

$4^2 = 16$ $3 \times 5 = 15$ works?

$n, (n+1), (n+2)$

$(n+1)^2 = n^2 + 2n + 1$

$n(n+2) = n^2 + 2n$

\therefore 1 unit larger proven.

Methods 1 Revision : Data Handling Overview A - Solutions

1(a) $\frac{3}{10}$

(b) $\frac{4}{6} = \frac{2}{3}$

2(a)

	1	2	3
1	1,1	1,2	1,3
2	2,1	2,2	2,3
3	3,1	3,2	3,3

$P(\text{same number}) = \frac{3}{9} = \frac{1}{3}$ (A1)

2(b)

	H	T
H	HH	HT
T	TH	TT

$P(\text{Two heads}) = \frac{1}{4}$ (A1)

3(a)

	10	10	10	50	50
10	10 10	10 10	10 10	10 50	10 50
50	50 10	50 10	50 10	50 50	50 50

$\frac{2}{10} = \frac{1}{5}$ (A1)

(b)

	S	S	T	T
S	SS	SS	ST	ST
S	SS	SS	ST	ST
S	SS	SS	ST	ST
T	TS	TS	TT	TT

(a) $\frac{6}{20} = \frac{3}{10}$

(b) $\frac{3}{20}$

(c) $\frac{11}{20}$

4(a) $\frac{26}{52} = \frac{1}{2}$ (b) $\frac{16}{52} = \frac{4}{13}$

(c) $\frac{16}{52} = \frac{4}{13}$ (d) $\frac{22}{52} = \frac{11}{26}$ (A4)

(b) $\frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$ (b) $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

(c) $\frac{1}{2} \times \frac{1}{2} + \frac{1}{2} \times \frac{1}{2} = \frac{1}{2}$ (A3)

5(a) (a) $P(RR) = \frac{7}{12} \times \frac{6}{11} = \frac{7}{22}$

(b) $P(RG \text{ or } GR) = \frac{7}{12} \times \frac{5}{11} + \frac{5}{12} \times \frac{7}{11}$
 $= \frac{70}{132} = \frac{35}{66}$ (A2)

(b) $P(GGG) = \frac{3}{9} \times \frac{2}{8} \times \frac{1}{7} = \frac{2}{168}$
 $= \frac{1}{84}$

(b) $P(GRY + RGY + YGR + YRG + GYR + RYG)$
 $= 6 \times \frac{3}{9} \times \frac{2}{8} \times \frac{1}{7} = \frac{2}{7}$

(A1)

(A1)

(A2)

(A2)

(A1)

(A2)

(A1)

(A1)

(A1)

(A1)

(A4)

(A3)

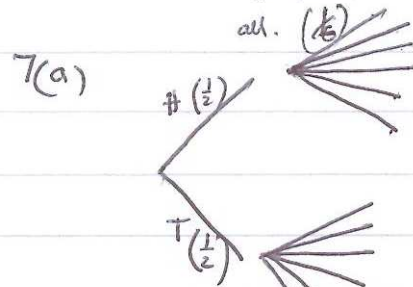
(A2)

(c) $P(GGR + GGY + GRG + GYG + RGG + YGG)$

$= 3 \times \frac{3}{9} \times \frac{2}{8} \times \frac{2}{7} + 3 \times \frac{3}{9} \times \frac{2}{8} \times \frac{1}{7}$
 $= \frac{12}{14} + \frac{6}{14} = \frac{18}{14} = \frac{9}{7}$

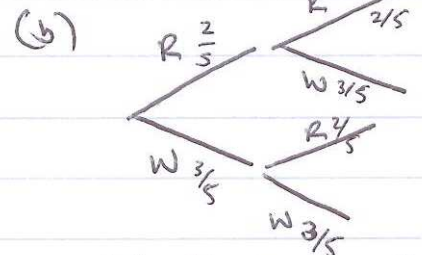
6(a) 7, 6, 14, 4, 31

(b) 7, 2, 5, 3, 8, 4, 0, 35



(a) $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$

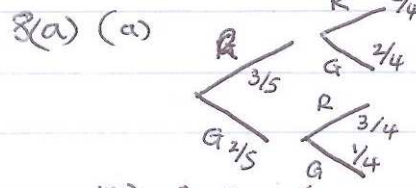
(b) $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$



(a) $\frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$

(b) $\frac{2}{5} \times \frac{3}{5} = \frac{6}{25}$

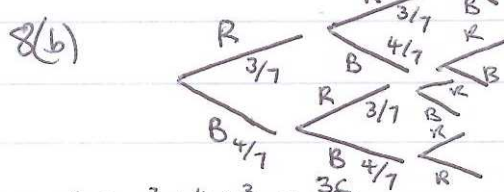
(c) $\frac{2}{5} \times \frac{3}{5} + \frac{3}{5} \times \frac{2}{5} = \frac{12}{25}$



(b) $\frac{3}{5} \times \frac{2}{4} = \frac{6}{20}$

(c) $\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$

(d) $\frac{2}{5} \times \frac{3}{4} = \frac{6}{20} = \frac{3}{10}$



(a) $\frac{3}{7} \times \frac{4}{7} \times \frac{3}{7} = \frac{36}{343}$

(b) $\frac{3}{7} \times \frac{3}{7} \times \frac{4}{7} = \frac{36}{343}$

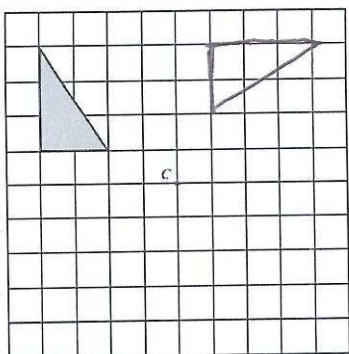
(c) $\frac{4}{7} \times \frac{3}{7} \times \frac{4}{7} = \frac{48}{343}$

(d) $\frac{3}{7} \times \frac{3}{7} \times \frac{3}{7} = \frac{27}{343}$

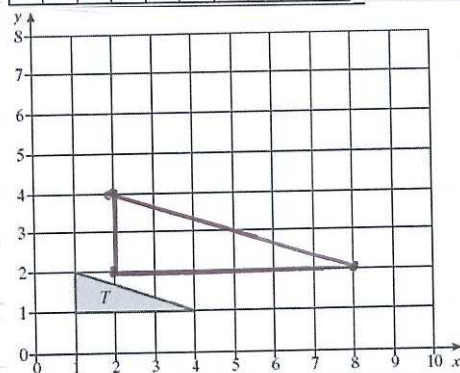
Methods 1 Revision: Shape and Space Questions A

1.(a) Rotation, 180° , centre (0,0) (A3)

(b)



2(a)



2(b) Enlargement, Scale factor $\frac{1}{2}$, centre (1,3) (A3)

3(a) Reflection in the line $y=3$ (A2)

(b) Reflection in the line $x=-1$ (A2)

4(a) $SF = 14.4 \div 1.2 = 12$ (M1)

$$x = 13 \times 1.2 = 15.6$$

$$y = 5 \times 1.2 = 6$$

(b) $SF = 10 \div 6 = 1.66$ (M1)

$$x = 15 \div 1.66 = 9$$

5(a) $x = 40^\circ$ AOB is isosceles (A2)

$y = 32^\circ$ Angles on ABT add to 180° (A2)

$z = 116$ BOC is isosceles (A2)

5(b) $p = 65^\circ$ BOC is isosceles (A2)

$q = 50^\circ$ Alternate (Z) angle (A2)

$r = 50^\circ$ $\triangle COD$ is isosceles
Alternate to \hat{D} (A2)

6(a) $AP \times 6 = 8 \times 4.5$ (M2)
 $AP = 6\text{cm}$ (A1)

(b) $4 \times 15 = 5 \times PD$ (M2)
 $PD = 12$ (A1)
 $DC = 12 - 5 = 7\text{cm}$

7(a) (i) $\vec{AB} = \vec{AO} + \vec{OB}$ (A1)
 $= -3\vec{a} + \vec{b}$

(ii) $\vec{RT} = \vec{RO} + \vec{OT}$ (A1)
 $= -2\vec{a} + 2\vec{b}$

$$\begin{aligned} 7(a)(iii) \vec{RS} &= \vec{RA} + \frac{1}{2} \vec{AB} \\ &= \vec{a} + \frac{1}{2} (-3\vec{a} + \vec{b}) \\ &= -\frac{a}{2} + \frac{b}{2} \end{aligned} \quad (A1)$$

$$\begin{aligned} b) \vec{ST} &= \vec{SB} + \vec{BT} \\ &= \frac{1}{2} (-3\vec{a} + \vec{b}) + \vec{b} \\ &= -\frac{3}{2}\vec{a} + \frac{3}{2}\vec{b} \end{aligned} \quad (M1) (A1)$$

Since $\vec{ST} = 3\vec{RS}$ they are in the same direction, same line as S is common

$$\begin{aligned} (c) RS &= 4 \Rightarrow ST = 12 \\ \Rightarrow RT &= 14 \end{aligned} \quad (M1) (A1)$$

$$7(b) a) (i) \vec{MQ} = \frac{1}{2} \vec{P} \quad (A1)$$

$$\begin{aligned} (ii) \vec{MN} &= \vec{MQ} + \vec{QN} \\ &= \frac{1}{2} \vec{P} - \frac{1}{2} \vec{r} \end{aligned} \quad (M1) (A1)$$

$$b) \vec{RP} = \vec{p} - \vec{r} \quad (M1)$$

$$\text{Since } \vec{RP} = 2\vec{MN} \quad (M1)$$

it is parallel (A1)

$$\begin{aligned} 8(a) \text{ Area scale factor} &= \frac{16928}{3200} \\ &= 5.29 \end{aligned} \quad (M1)$$

$$\begin{aligned} \text{Linear scale factor} &= \sqrt{5.29} \\ &= 2.3 \end{aligned} \quad (M1)$$

$$\begin{aligned} \Rightarrow \text{Volume Scale factor} &= 2.3^3 \\ &= 12.167 \end{aligned} \quad (M1)$$

$$\begin{aligned} e) \text{ Volume B} &= 12.167 \times 4760 \\ &= 57914.92 \text{ cm}^3 \end{aligned} \quad (A1)$$

$$\begin{aligned} 8(b) VSF &= \frac{136}{17} \\ &= 8 \end{aligned} \quad (M1)$$

$$\Rightarrow LSF = \sqrt[3]{8} = 2 \quad (M1)$$

$$\Rightarrow ASF = 2^2 = 4 \quad (M1)$$

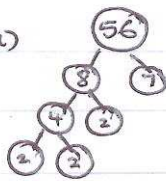
$$\begin{aligned} \Rightarrow \text{Area of D} &= 4 \times 9.6 \\ &= 38.4 \text{ cm}^2 \end{aligned} \quad (A1)$$

Methods 1 Revision Number Questions A - Solutions

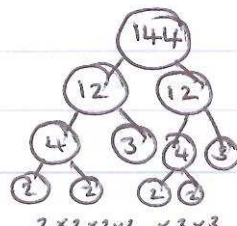
1 (a) 873

(b) 72800

2. (a)

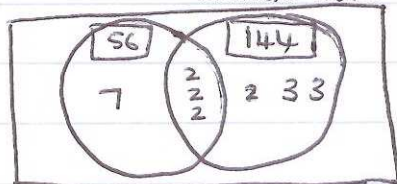


$2 \times 2 \times 2 \times 7$



$2 \times 2 \times 2 \times 2 \times 3 \times 3$

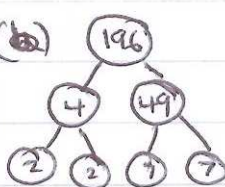
(b)



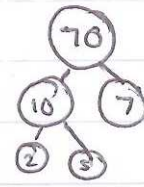
(c) HCF = $2 \times 2 \times 2 = 8$

(d) LCM = $7 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 1008$

2 (b)

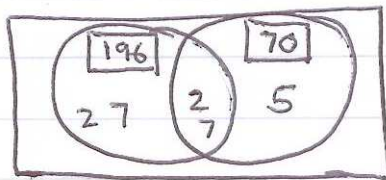


$2 \times 2 \times 7 \times 7$



$2 \times 5 \times 7$

(b)



(c) HCF = $2 \times 7 = 14$

(d) LCM = $2 \times 2 \times 5 \times 7 \times 7 = 980$

3 (a) (i) 5.34×10^8 (ii) 6.7×10^{-8}

(b) (i) 2.8×10^{11} (ii) 5.43×10^{-10}

4 (a) (i) 250 000

(ii) 0.000 000 734

(b) (i) 6 780 000

(ii) 0.000 012

5 (a) (i) 6.6×10^{18}

(ii) 5×10^{-6}

(b) 15.6×10^{16}
 $= 1.56 \times 10^{17}$

(ii) 4×10^{13}

(A1) 6 (a) (i)

(A1) (ii)

(b) (i) $\frac{2}{77}$ (ii) $\frac{6}{56} = \frac{3}{28}$ (A2)

7 (a) (i) 1 (ii) 8 (iii) 16 (A3)

(b) (i) 1 (ii) 2 (iii) $\frac{1}{9}$ (A3)

8 (a) (a) $2\sqrt{3}$ (b) $6\sqrt{2}$ (c) $10\sqrt{5}$ (A3)

(b) (a) $4\sqrt{2}$ (b) $5\sqrt{3}$ (c) $10\sqrt{3}$ (A3)

(A1)

9 (a) (a) $14 + 2\sqrt{5} + 7\sqrt{5} + 5 = 19 + 9\sqrt{5}$ (M1) (A1)

(b) $2 + 3\sqrt{2} - 5\sqrt{2} - 15 = -13 - 2\sqrt{2}$ (M1) (A1)

(c) $15 - 10\sqrt{7} - 3\sqrt{7} + 14 = 29 - 13\sqrt{7}$ (M1) (A1)

9 (b) (a) $9 + 3\sqrt{5} + 3\sqrt{5} + 5 = 14 + 6\sqrt{5}$ (M1) (A1)

(b) $2 + 3\sqrt{2} - 5\sqrt{2} - 15 = -13 - 2\sqrt{2}$ (M1) (A1)

(c) $9 - 6\sqrt{7} - 6\sqrt{7} + 28 = 37 - 12\sqrt{7}$ (M1) (A1)

10 (a) (a) $\frac{2}{\sqrt{3}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{2\sqrt{5}}{3}$ (A1)

(b) $\frac{7\sqrt{11}}{11}$ (A1)

(c) $\frac{2}{\sqrt{5}+1} = \frac{2(\sqrt{5}-1)}{(\sqrt{5}+1)(\sqrt{5}-1)} = \frac{2\sqrt{5}-2}{4}$ (M1) (A1)

10 (b) (a) $\frac{\sqrt{2}}{\sqrt{8}} \times \frac{\sqrt{8}}{\sqrt{8}} = \frac{\sqrt{16}}{8} = \frac{4}{8} = \frac{1}{2}$ (M1) (A1)

(b) $\frac{7}{(5-\sqrt{2})} \times \frac{(5+\sqrt{2})}{(5+\sqrt{2})} = \frac{35+7\sqrt{2}}{25-2} = \frac{35+7\sqrt{2}}{23}$ (M1) (A1)

(A1)

(A1)

(A1)

(A1)

(A2)

(A2)

(A2)

(A2)